pieces. There are no helical components to the magnet assembly fields and no rotational constraint is required.

The magnetic circuit of the electromagnetic devices of Kling do not include a helical component. With Kling, each group has its own magnetic circuit which have axial and radial components only.

With respect to claims 7 and 8, which require an additional restraint for relative rotational movement, combining the teachings of Davey et al. with the teachings of Kling, runs expressly counter to the intent of Kling with regards to the embodiment depicted in Fig. 25. As noted above, that embodiment is specifically directed to imparting helical motion and simply would not operate if rotational movement were constrained. Although the teachings of Davey et al. may possibly be applicable to the Fig. 26 embodiment of Kling, the Fig. 26 embodiment of Kling does not disclose or suggest a helical magnet circuit. Taken as a whole, Kling clearly teaches imparting at least some rotational force when both the stator coils and the magnet assembly are arranged in a helical magnetic path.

With respect to the rejection of claims 11-12 as obvious over Kling in view of Prymak, the skewed armature of Prymak is used to reduce cogging effects which is a particular problem with rotary DC motors. In Prymak the laminations are described as "skewed" not helical. This is an important distinction. The field components that occur in a DC motor are primarily radial and tangential -- there are no helical components. Although

the laminations are skewed, they are still planar and are not designed to carry a helical magnetic field. With the present invention, the laminations describe true helical structures because they are required to carry helical fields. Helical laminations are used in the present invention to reduce eddy current losses and are not concerned with cogging. Hence, even if it did occur to someone to use the skewed laminations of Prymak with the electromagnetic device of Kling, this would still not arrive at the helical laminations provided to carry helical magnetic circuit of the present invention.

With respect to the rejection of claim 14 as obvious over Kling in view of Delson et al., one of ordinary skill would not combine the teachings to try the invention defined by claim 14. Delson describes a type of actuator that has to distinct features: (1) the actuators utilize repulsive magnetic forces; and (2) they are used in pairs in a balanced configuration. In Delson et al., the torque measuring transducer would be mounted as an intervening component between the connecting link and the interface member. Hence, the measured torque would be the torque transmitted between these two components. This torque would generally have three components: (a) the net torque which if the two axial transducers are balanced should be zero; (b) the torque due to the dynamics of the mechanism -- movement of the actuator mechanism will necessarily have a torque associated with it; and (c) the torque generated by friction in the pivot. The measured torque will be the sum of these three components and it would not be straightforward, if indeed at all possible, to extract from

such a measurement a measurement of axial force. The dynamics of the mechanism would have to be fully known to interpret any measurements. Due to the difficulties in extracting useful information about axial force from the transducers described in Delson et al., it cannot be obvious to implement such a system with the devices of Kling. In any event, as explained above, the embodiments described in Kling either cannot have their motion constrained or have no need of restraint. Hence, the considerations for measuring axial force do not arise.

For the above reasons, Applicant respectfully asserts that the presently claimed invention is patentable over the prior art. Reconsideration and allowance of the claims is respectfully requested.

Respectfully submitted,

Michael Dadd

By _____
C. Frederick Koenig III, Esquire
Registration No. 29,662
(215) 568-6400

Volpe and Koenig, P.C.
Suite 400, One Penn Center
1617 John F. Kennedy Boulevard
Philadelphia, PA 19103

CFK/fap
Attachment